

## CLAIMS

1. A brake mechanism for a braking system in a motor vehicle, the braking system including an input rod for effecting actuation of vehicle brakes, the brake mechanism comprising:

    a pedal arm pivotally connected to the vehicle, a free end of the pedal arm having a brake pedal receiving an input force;

    a beam interposed between the pedal arm and the input rod for transmitting an output force from the pedal arm to the input rod, the beam pivotally connected to the pedal arm and rotatable relative thereto;

    a cam defining a cam profile, the beam contacting the cam and following the cam profile as the pedal arm swings relative to the vehicle, the cam profile shaped to adjust the position of the beam to modify the ratio of the output force to the input force of the brake mechanism.

2. The brake mechanism of claim 1, wherein the position of the beam relative to the pedal arm determines the force ratio of the brake mechanism.

3. The brake mechanism of claim 1, wherein the pedal arm travels between at least a neutral position and an extended position.

4. The brake mechanism of claim 3, wherein the force ratio quickly increases as the pedal arm travels beyond a predetermined point past the neutral position to the extended position.

5. The brake mechanism of claim 3, wherein the force ratio at the extended position is sufficient for vehicle braking in a failed power situation.
6. The brake mechanism of claim 3, wherein the beam is pivotally connected to the input rod, and wherein the beam rotates relative to the input rod as the pedal arm swings relative to the vehicle.
7. The brake mechanism of claim 6, wherein the beam is generally perpendicular to the input rod when the pedal arm is in the neutral position.
8. The brake mechanism of claim 6, wherein the beam is aligned with the input rod when the pedal arm is in the extended position.
9. The brake mechanism of claim 1, wherein the cam profile includes a first portion generally perpendicular to the input rod and a second portion generally parallel to the input rod.
10. The brake mechanism of claim 9, wherein the cam profile includes a third portion connecting the first and second portions, the third portion being curved in shape.
11. A brake mechanism for a braking system in a motor vehicle, the braking system including an input rod for transmitting force to a master cylinder for pressurizing braking fluid in brake lines leading to wheel brakes, the brake mechanism comprising:

a pedal arm pivotally connected to the vehicle, the pedal arm receiving an input force from an operator of the vehicle;

    a beam pivotally connected to the pedal arm at a first point along the beam, the beam connected to the input rod at a second point along the beam, the beam transmitting an output force from the pedal arm to the input rod;

    a cam having a surface defining a cam profile;

    the beam contacting the cam at a third point along the beam and following the cam profile,

    the beam pivoting relative to the pedal arm as the beam follows the cam profile to adjust the ratio of the output force to the input force of the brake mechanism.

12. The brake mechanism of claim 11, wherein the position of the beam relative to the pedal arm is determined by the shape of the cam profile.

13. The brake mechanism of claim 11, wherein the position of the second point relative to the first point is determined by the shape of the cam profile.

14. The brake mechanism of claim 11, wherein the position of the second point relative to the first point determines the force ratio of the braking mechanism.

15. The brake mechanism of claim 11, wherein the second point moves from a position vertically below the first point to a position substantially horizontally aligned with the first point.

16. The brake mechanism of claim 11, wherein the pedal arm travels between a non-braked position and a braked position, and wherein the second point moves vertically upward as the pedal arm travels from the non-braked position to the braked position.

17. The brake mechanism of claim 11, wherein the first point separates the second and third points.

18. The brake mechanism of claim 11, wherein the beam includes a roller at the third point, the roller contacting the cam and following the cam profile.

19. The brake mechanism of claim 11, wherein the surface of the cam defines a track defining the cam profile, the beam engaging the track.

20. The brake mechanism of claim 11, wherein the cam profile includes a substantially vertical surface transitioning into a substantially horizontal surface.